

Attachment 2

Integral Recycling Guidance Under M.G.L.C 21I

Introduction

The Toxics Use Reduction Act (TURA) identifies six (6) techniques which constitute toxics use reduction. The sixth technique is "Recycling, reuse or extended use of toxics by using equipment or methods which become an integral part of the production unit of concern, including but not limited to filtration and other closed loop methods." TURA also states, in part, "toxics use reduction shall not include... off-site or out-of-production unit waste recycling." This guidance provides detail on what types of activities are considered "integral recycling" under TURA.

The attachment to this guidance also provides general guidance on how each activity is regulated under DEP's hazardous waste regulations (310 CMR 30.000). The reader must refer to the specific hazardous waste regulations, separate from this TURA guidance, to assure operational compliance with hazardous waste requirements. Critical terms such as "integral," "production process," "closed loop," "totally enclosed," and others are used differently under different statutes. As such, people must be careful to consider differing requirements to avoid non-compliance problems. Companies should check the regulations themselves or contact DEP for further compliance assistance, if needed.

Should this integral recycling guidance result in significant reductions in your 1995 facility-wide use or byproduct figures, please contact Lynn Heisey at DEP (617-292-5711). Such significant changes in reporting can skew TURA trend data analysis and your notification to DEP will allow us to adjust our figures to prevent overcounting of actual reductions.

Definition

Activities Considered "Integral Recycling" Under This Guidance

- In order for an activity to qualify as "integral recycling" the material must be recycled or reused, not treated. From the TURA perspective, this is important because the statutory language refers to "recycling, reuse or extended use of toxics..." and also because the statutory definition of toxics use reduction specifically excludes anything that is, or that promotes "end-of-pipe treatment".
- If the recycling equipment and piping are permanently connected to a single production unit, the operation is integral. Also, if the recycling equipment is connected via detachable* hoses to a single production unit, the operation is integral.

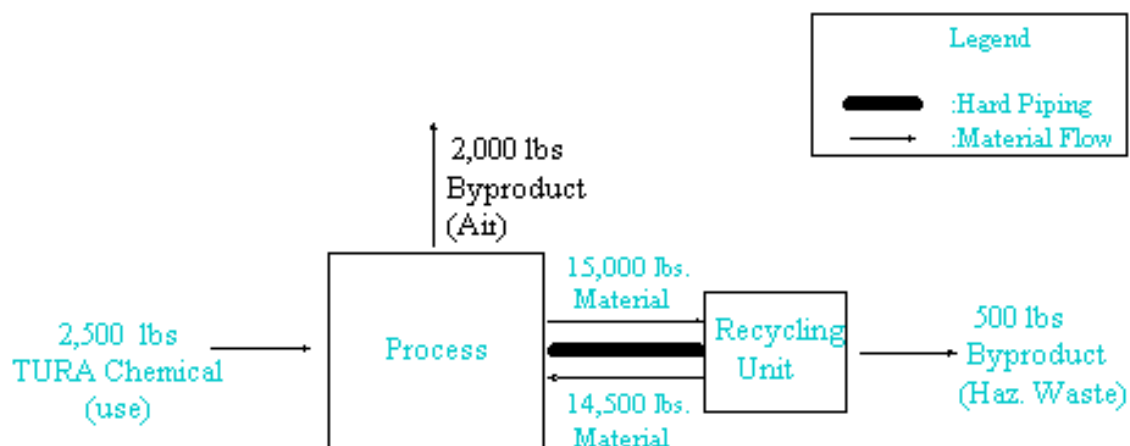
- Detachable*, portable recycling equipment, directly connected to the production unit while the recycling equipment is in operation, is considered integral. There must be a sealed connection while the unit is in operation.
- If a manufacturing process includes a directly connected holding tank as part of its production unit, and the recycling unit is directly connected to the tank, this qualifies as integral recycling under this policy.

** Whenever detachable pipes are used in conjunction with a recycling unit, a written spill prevention plan must be prepared and kept on file to minimize worker exposure and to prevent spills and leaks when connecting, disconnecting, and operating the recycling unit. This spill prevention plan minimizes any increased risk of worker exposures that may arise from this expanded definition of integral recycling under TURA. TURA filers who do not wish to prepare and keep on file this spill contingency plan should consider the recycling unit (connected via detachable hoses) non-integral under TURA and report accordingly.*

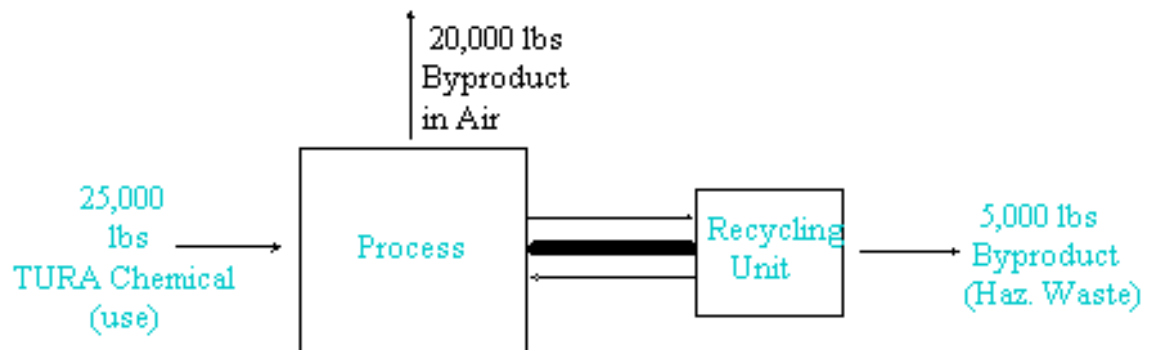
Integral Recycling Examples

Example 1: A recycling unit which is hard-piped to the process qualifies as integral. The recycling unit is totally enclosed during operation. (Totally enclosed recycling units are units that have been designed, constructed, and operated to prevent spills, leaks or emissions of hazardous materials to the workplace and environment.)

A. This diagram illustrates the materials accounting and quantities generated each time the reportable chemical is an input to this process. (For this example, it occurs ten times each year).



B. This diagram shows quantities reported annually for this chemical which are integrally recycled in this process.



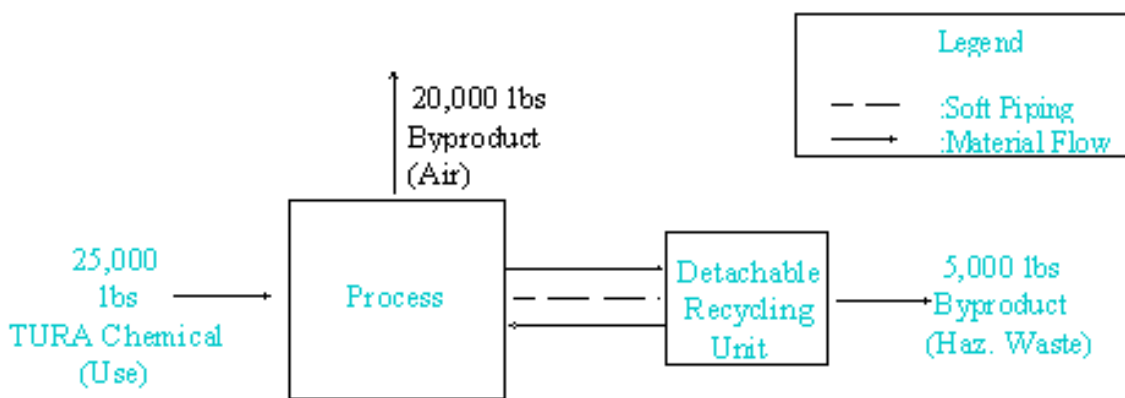
Description of example process: As shown in diagram A, ten times a year 2,500 lbs of virgin chemical is fed into the process to supplement the 14,500 lbs of integrally recycled chemical which is reintroduced to the process on the same schedule. While parts are being processed using each of ten batches of chemical, 2,000 lbs of byproduct is released into the air. When each batch of chemical is spent, it is pumped through the integrally connected recycling unit which produces 500 lbs of byproduct as hazardous waste per batch. The quantities in diagram B show the yearly amounts of byproduct produced and material processed. Because the unit is integrally connected the chemical recycled is not reported as an input to the process, and spent chemical piped to the recycling unit is not considered byproduct. If any of the recycled solvent can not be used in the process, and is shipped off-site for reuse without any treatment or recovery, it would be considered byproduct as product and reported in section 1.2e "Shipped in or as Product." (See section on [Byproduct as Product](#), p.5).

For this example of Integral Recycling, the Form S, Section 1.2 would be filled out as follows:

1.2a Manufactured:	0 lbs	1.2d Generated as Byproduct	25,000 lbs
1.2b Processed:	0 lbs	1.2e Shipped in or as Product:	0 lbs*
1.2c Otherwise Used:	25,000 lbs		

* If any integrally recycled material is shipped as product, (byproduct as product), section 1.2e would reflect that quantity.

Example 2: To qualify as integral recycling, the portable recycling unit must be connected while the recycling unit is in operation via detachable couplings that are appropriate for such use and perform similarly to hard piping. The recycling unit is totally enclosed during operation. A written spill prevention plan must be present to minimize risk of worker exposure and to prevent spills or leaks when connecting/disconnecting or operating the recycling equipment.



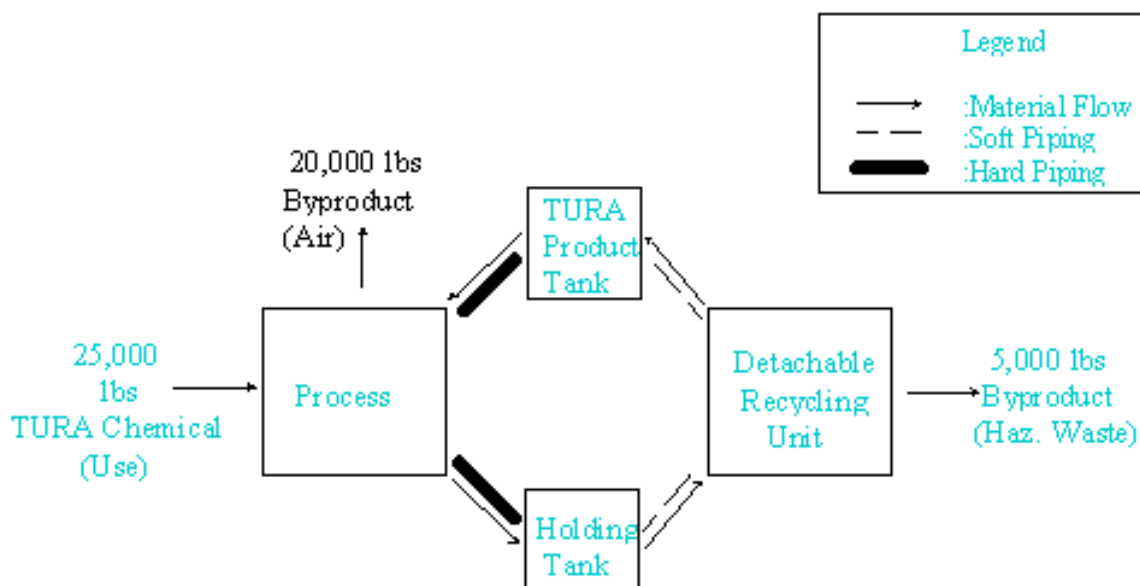
Description of example process: *The quantities in the diagram show the yearly amounts of byproduct produced and material processed. Because the unit is integrally connected, the recycled chemical is not reported as an input to the process, and spent chemical piped to the recycling unit is not considered byproduct. If any of the recycled solvent can not be used in the process, and is shipped off-site for reuse without any treatment or recovery, it would be considered byproduct as product and reported in section 1.2e "Shipped in or as Product." (See section on [Byproduct as Product](#), p.5).*

For this example of Integral Recycling, the Form, S Section 1.2 would be filled out as follows:

1.2a	Manufactured:	0 lbs	1.2d	Generated as Byproduct:	25,000 lbs
1.2b	Processed:	0 lbs	1.2e	Shipped in or as Product:	0 lbs*
1.2c	Otherwise Used:	25,000 lbs			

** If any integrally recycled material is shipped as product, (byproduct as product), section 1.2e would reflect that quantity.*

Example 3: A recycling process which utilizes a holding tank, piped to the process, to store spent chemicals which are then recycled via either a permanent or detachable recycling unit, qualifies as integral. The recycling unit must be connected to the holding tank while the unit is in operation. The unit must also be totally enclosed while in operation (as explained in example 1, p.2). A written spill prevention plan must be present to minimize risk of worker exposure, to prevent spills or leaks when connecting/disconnecting or operating the recycling equipment.



Description of sample process: *The quantities in the diagram show the yearly amounts of byproduct produced and material processed. Because the unit is integrally connected, the recycled chemical is not reported as an input to the process and spent chemical piped to the recycling unit, is not considered byproduct. If any of the recycled solvent can not be used in the process, and is shipped off-site for reuse without any treatment or recovery, it would be considered byproduct as product and reported in section 1.2e "Shipped in or as Product." (See section on [Byproduct as Product](#), p.5).*

For this example of Integral Recycling, the Form S, Section 1.2 would be filled out as follows:

1.2a	Manufactured:	0 lbs	1.2d	Generated as Byproduct	25,000 lbs
1.2b	Processed:	0 lbs	1.2e	Shipped in or as Product:	0 lbs*
1.2c	Otherwise Used:	25,000 lbs			

* If any integrally recycled material is shipped as product, (byproduct as product), section 1.2e would reflect that quantity.

Byproduct as Product

A byproduct that is product means a byproduct that is used as a raw material without treatment or processing. If a byproduct is treated before it is used as a raw material, then it is not a product. For TURA purposes, byproduct as product should be listed as a product of the production unit. For example, some recycled paints or solvents can be sold to buyers who can use them as they are. While these would not be counted as byproducts, they would need to be counted in the amount of the chemical shipped off-site as product.

Byproduct as Product Reporting Under TURA: Chemical amounts being reported as byproduct as product must be listed in the Form S in section 4 as a second product for that production unit. Therefore, at least, two products will be listed in any production unit that produces byproduct as product.

Section 4: Facility-Wide Listing of Production Units

Production This Production Unit (Process/Product Combination) is:
☒ The Same as reported Last Year ☐ New

Unit #: Describe the Process: Degreasing Metal

Parts

1

Describe the Product: Cleaned Metal Parts and Recycled
Solvent

Product SIC Code: /3/4/4/9/ / / / / / / / / /
/ /

Describe the Unit of Product: Square Inches of Cleaned
Metal Parts

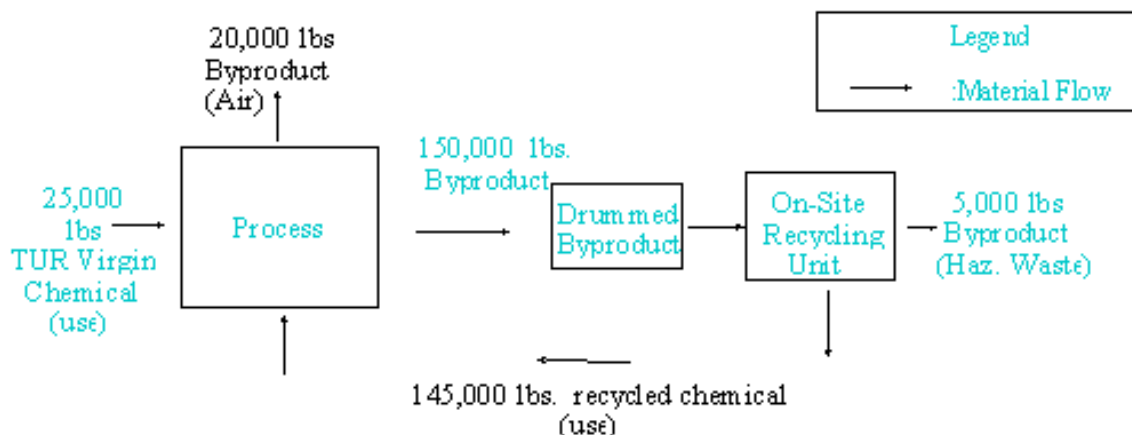
(Please specify if the Unit of Production has been
changed since the previous reporting year.)

Non-Integral Recycling (On-Site)

Activities where spent material is removed from the process and transferred into barrels or other containers, are not considered integral under this policy. To be considered integral, spent material from the production process must be pumped directly into the recycling unit or into a directly connected holding tank, and then to a directly connected recycling unit.

Example 4 (Non-integral, On-Site Recycling Reporting): Many companies have non-integral recycling operations on-site. Their processes include drumming and transporting the material to a different location in the plant at some point during the operation. Although these recycling processes are not considered "integral recycling," TURA and this guidance recognize on-site, non-integral recycling as follows: Companies practicing on-site, non-integral recycling are required to count the recycled chemical as byproduct each time it exits the production unit. Additionally, each time the recycled material is reintroduced as an input to the production unit, it is added to chemical use quantities at the production unit level, but not to the facility-wide use levels. Therefore, any type of on-site recycling is not counted towards facility-wide use of the chemical, and will result in a reduction in the facility-wide total usage number.

Non-Integral Recycling Example (on-site) Quantities based on yearly totals reported



Description of Sample Process: Each year, 25,000 lbs of virgin chemical plus 145,000 lbs of recycled chemical are added to the process (inputs). Each year 20,000 lbs of byproduct are released to the air and 150,000 lbs of spent chemical is drummed and brought to the on-site recycling unit. The recycling unit generates 5,000 lbs of hazardous waste. The quantities in the diagram show the yearly amounts of byproduct produced and materials processed. Because this is on-site non-integral recycling, the 145,000 lbs of recycled chemical is not counted towards facility-wide use, but is counted toward chemical use at the production unit level.

For this example of a company performing Non-Integral On-Site Recycling, the Form S, Section 1.2 would be filled out as follows:

1.2a Manufactured: 0 lbs 1.2d Generated as Byproduct: **175,000 lbs**
 1.2b Processed: 0 lbs 1.2e Shipped in or as Product: 0 lbs
 1.2c Otherwise Used: **25,000 lbs**

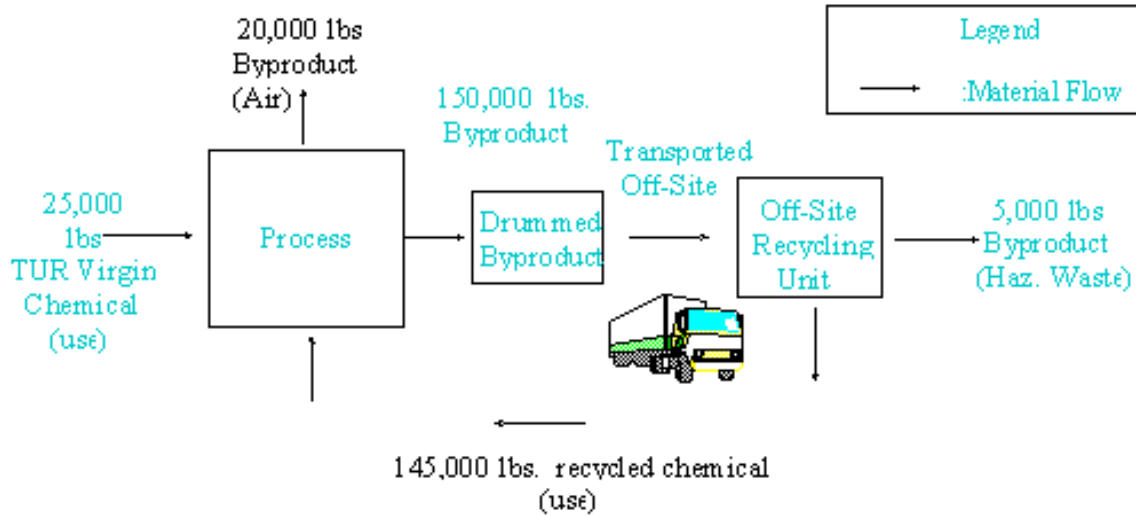
Note:

This example, when compared to the non-integral off-site recycling example below, demonstrates how facility-wide input numbers are minimized with non-integral, on-site recycling. It should be noted on the Form S, in Section 1.3, that on-site recycling has affected the materials balance for this chemical.

Non-Integral Recycling (Off-Site)

Example 5 (Non-Integral Off-Site Recycling Reporting): Activities where materials are sent off-site for recycling are not considered integral under this guidance. Materials recycled off-site and reintroduced into the process, must be counted as byproduct and use both at the facility-wide and production unit levels. This can add significantly to the amount of chemical brought on-site and reported as facility-wide chemical use.

Non-Integral Recycling Example (off-site)
Quantities based on yearly totals reported



Description of Example Process: Each year, 25,000 lbs of virgin solvent plus 145,000 lbs of recycled solvent are added to the process (inputs). Each year, 20,000 lbs of byproduct are released to the air and 150,000 lbs spent chemical is drummed and shipped off-site to a company which recycles spent solvent. This off-site recycling unit generates 5,000 lbs of hazardous waste. The quantities in the diagram show the yearly amounts of byproduct produced and material processed. Because of this off-site non-integral recycling, the recycled chemical, as well as the virgin chemical, must be counted as inputs to the process. Additionally, the spent chemical, as well as the byproduct emitted to the air, must be counted as byproduct. The 5,000 lbs of hazardous waste byproduct is neither generated nor reported by this facility.

For this example of a company performing Non-Integral Off-Site Recycling, the Form S section 1.2 would be filled out as follows:

1.2a Manufactured: 0 lbs 1.2d Generated as Byproduct: **170,000 lbs**
 1.2b Processed: 0 lbs 1.2e Shipped in or as Product: 0 lbs
 1.2c Otherwise Used: **170,000 lbs**

Attachment 2A

Hazardous Waste Specific Requirements

Example 1, Integral Recycling (Page #2-3)

- The recycling unit is integral to the process, and therefore exempt from 310 CMR 30.000.
- The recycling unit does not need a recycling permit.
- The byproduct generated from the recycling unit is managed as:
 1. Hazardous waste, and as such, counts towards generator status

or

2. Class A regulated recyclable material (notification "permit" required, 310 CMR 30.212)

Example 2, Integral Recycling with Portable Recycling Unit (Page #3-4)

- The recycling unit is integral to the process, and therefore exempt from 310 CMR 30.000.
- The recycling unit does not need a recycling permit.
- The byproduct generated from the recycling unit is managed as:
 1. Hazardous waste, and as such, counts towards generator status

or

2. Class A regulated recyclable material (notification "permit" required, 310 CMR 30.212)

Example 3, Integral Recycling Incorporating Holding Tank (Page #4-5)

- The holding tank is regulated as a hazardous waste accumulation container, subject to generator standards for tanks (310 CMR 30.205(19)).
- The facility's generator status calculation includes the amount fed into the holding tank.
- The recycling unit is regulated as a hazardous waste recycling unit, and therefore needs a Class A or Class B (4) recycling permit (310 CMR 30.212 or 30.213(4))

Example 4, On-Site Non-Integral Recycling (page #6-7)

- Hazardous waste regulations apply to the drummed byproduct.
- Rate of generation includes the amount of byproduct drummed.
- Hazardous waste recycling permit is required.

Example 5, Off-Site Non-Integral Recycling (Page #7-8)

- Hazardous waste regulations apply to the drummed byproduct.
- Rate of generation includes the amount of byproduct drummed.
- Hazardous waste recycling permit is required for the generator and the recycling facility.

Associated Hazardous Waste Issues

General Compliance Issues

Recycling vs. Treatment

In order for an activity to qualify as "integral recycling," the material must be recycled or reused, not treated. From the TURA perspective, this is important because the statutory language refers to "recycling, reuse, or extended use of toxics..." and also because the statutory definition of toxics use reduction specifically excludes anything that is, or that promotes, "end-of-pipe treatment". From the hazardous waste perspective, this is important because treatment activities require licenses under both M.G.L.c. 21C and RCRA.

In order to be consistent with RCRA, the following criteria apply when determining whether an activity constitutes recycling: *

- Is the secondary material as effective as the raw material it replaces?
- Can the secondary material be fed directly into the process or is reclamation required?
- How much of the secondary material is used as compared to the analogous raw material?
- Is the secondary material managed in a manner consistent with the raw material?
- Are the toxic constituents actually necessary to the product or are they just along for the ride (toxics along for the ride)?

*These criteria are taken from the Federal Register FR, 53 FR at 522, 52 FR at 17013 and 50 FR at 638.

Inherently waste-like material

The preceding guidance does not apply to those hazardous wastes listed as F020 , F021,

F022, F023, F026, F028, since those hazardous wastes are inherently waste-like and must be managed as a hazardous waste, pursuant to the definition of hazardous waste contained at 310 CMR 30.000. Furthermore, those inherently waste-like wastestreams cannot be managed as regulated recyclable materials, since there is no exemption provided in 310 CMR 30.200 for those materials. However, there may be circumstances in which the "treatment that is integral..." exemption, cited in 310 CMR 30.000 might apply and in fact, exempt these wastes from hazardous regulations.

State-Only vs. EPA

Concerning other hazardous waste regulatory compliance issues, a TURA filer must keep in mind that since some hazardous waste activities are regulated on a state-only basis, for these wastes, the DEP can exert a measure of discretion in policy-making. However, other activities are regulated by both DEP and EPA, and in these circumstances, the DEP's discretion is generally more limited to federal rulings. For example:

- a. Characteristic sludges/byproducts being reclaimed are regulated by the DEP, only, and can be managed as hazardous waste, or if being reclaimed, they can be managed as a regulated recyclable material.
- b. Listed sludges/byproduct being reclaimed are regulated by both EPA and DEP.
- c. Spent materials being reclaimed on-site are regulated by both EPA and DEP.

Other State and Federal Laws or Regulations

This guidance does not relieve those responsible for these "recycling activities" from regulatory responsibility contained in any other applicable State or Federal Law or Regulation . It is incumbent upon the responsible parties to conduct the recycling

activities at all times in a manner that is protective to public health, safety, and to the environment. To that end, the Department reserves its rights pursuant M.G.L. c. 21C, and M.G.L. c. 21I, to review and evaluate any such activity, on a case-by-case basis, and to require persons or entities managing these activities to comply fully with these laws.